

CHAPTER 3: ENVIRONMENTAL ANALYSIS

3.0 APPROACH AND METHODOLOGY

This chapter combines the description of baseline environmental conditions (Affected Environment) and the analysis of environmental effects (Environmental Consequences) for each resource. Though these two aspects are often in separate chapters in an EIS, they are combined here to facilitate continuity for the reader from baseline conditions to potential effects to each resource. Following the description of baseline conditions, the Environmental Consequences sections under each resource provide the scientific and analytic basis for evaluation of the potential effects of each of the alternatives described in Chapter 2 on the physical, biological, and social environments. Direct and indirect effects to each resource are analyzed in this chapter. Cumulative Effects and the potential contribution of the proposed alternatives to the effects of the past, present, and reasonably foreseeable future actions are analyzed in Chapter 4, Cumulative Effects. These terms are defined and steps are described in more detail below.

3.0.1 DEFINITION OF IMPACT TYPES

The following terms are used throughout this document to discuss effects:

- Direct Effects – caused by the action and occur at the same time and place (40 CFR 1508.8). The EIS Analysis Area and areas of potential effects are further described below.
- Indirect Effects – defined as effects which are “caused by an action and are later in time or farther removed in distance but are still reasonably likely. Indirect impacts may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems” (40 CFR 1508.8). Indirect effects are caused by the project, but do not occur at the same time or place as the direct effects.
- Cumulative Effects – additive or interactive effects that would result from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR 1508.7). Direct effects are limited to the proposed action and alternatives only, while cumulative effects pertain to the additive or interactive effects that would result from the incremental impact of the proposed action and alternatives when added to other past, present, and reasonably foreseeable future actions. Interactive effects may be either greater or less than the sum of the individual effects; thus, the action’s contribution to the cumulative case could increase or decrease the net effects.
- Reasonably Foreseeable Future Actions – this term is used in concert with the Council on Environmental Quality (CEQ) definitions of indirect and cumulative effects, but the term itself is not further defined. Most regulations that refer to “reasonably foreseeable” do not define the meaning of the words, but do provide guidance on the term. For this analysis, reasonably foreseeable future actions are those that are external to the proposed action, and likely (or reasonably certain) to occur, although they may be uncertain. Typically, they are based on documents such as existing plans, permit

applications, and fiscal appropriations. Reasonably foreseeable future actions considered in the cumulative effects analysis consist of projects, actions, or developments that can be projected, with a reasonable degree of confidence, and for this analysis would occur over the next 10-30 years. For a listing of RFFAs see Table 4.2-1 in Chapter 4, Cumulative Effects.

3.0.2 EIS ANALYSIS AREA AND SCOPE OF ANALYSIS

The EIS Analysis Area is described in relation to the action alternatives identified in Chapter 2. The action alternatives each consist of a mine site, transportation facilities, and pipeline components. While the EIS Analysis Area can be delineated based on the physical footprint of the action alternatives, potential resource impacts are considered in a spatial context appropriate to each resource. For example the analysis of impacts to soils may be limited to disturbance within the physical footprint of the project component. The impacts to wetlands, however, would be considered in relation to wetland functions and values in watersheds. For migratory fish, waterfowl, and other wildlife, the analysis must consider the effects in relation to stocks and populations throughout their migratory range.

3.0.3 INCOMPLETE AND UNAVAILABLE INFORMATION

The CEQ guidelines require that:

When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking (40 CFR 1502.22).

In the event that there is relevant information, but “the overall costs of obtaining it are exorbitant or the means to obtain it are not known” (40 CFR 1502.22), the regulations instruct that the following should be included:

- A statement that such information is unavailable;
- A statement of the relevance of such information to evaluate reasonably foreseeable significant adverse impacts;
- A summary of existing information that is relevant to evaluating the adverse impacts; and
- The agency’s evaluation of adverse impacts based on generally-accepted scientific methods.

In the analysis, this EIS identifies those areas where information is unavailable to support a thorough evaluation of the environmental consequences of the alternatives. The Corps initiated a data gap analysis in early 2013, in which specialists reviewed the data and source documents from the Donlin Gold Environmental Evaluation Document (ARCADIS 2013a) and the additional technical literature known for each resource area. The preliminary analysis was reviewed by the cooperating agencies and a final report was developed in July 2013. A second round of review resulted in an updated data gap analysis focused on selected resources in April 2014.

In order to clarify the status of existing data for several resource areas, Technical Working Groups were convened. Specialists from the Corps, cooperating agencies, Donlin Gold, and the EIS Team, met for 1- to 2-day workshops (see Table 3.0-1).

Table 3.0-1: Technical Working Groups to Address Data Gaps

April 15-16, 2013	Anchorage	Surface and Subsurface Water Hydrology
June 4, 2013	Anchorage	Geochemical Characterization and Water Quality Prediction
June 24, 2013	Anchorage	Fisheries and Aquatics
July 9, 2013	Anchorage	Visual Resource Management
November 5-7, 2013	Aniak	Subsistence and Traditional Ecological Knowledge
March 26-27, 2014	Anchorage	Subsistence and Traditional Ecological Knowledge
April 15, 2014	Anchorage	Barging

As a result of the data gap reviews, several additional field studies were initiated: additional deep well pump testing to evaluate streambed hydraulic conductivity in 2013; Kuskokwim River rainbow smelt spawning study in May 2014; and Kuskokwim River juvenile salmon habitat use study in July and August-September 2014. It is anticipated that additional field work on rainbow smelt spawning and out-migrating juvenile salmon habitat use will be conducted in 2015.

In addition, a process of Requests For Additional Information (RFAI) was initiated in 2013. In many cases, these requests resulted in significant new analysis and reanalysis of models for detailed technical issues. Other requests resulted in new data and engineering information. As of April 2015, a total of 61 RFAs have been submitted.

These efforts have been undertaken to obtain all relevant information necessary for the EIS. However, a limited number of data gaps still exist at this time for several reasons, such as the costs of obtaining the missing data are exorbitant, the data will take several years to obtain, or the means to obtain the data are unknown. Where data gaps still exist, the EIS provides the information required under CEQ guidelines. The resource impact analyses in Chapter 3 discuss limitations of data, where appropriate.

3.0.4 METHODS FOR DETERMINING LEVEL OF IMPACT

3.0.4.1 DIRECT AND INDIRECT EFFECTS

Direct and indirect effects, as defined above, could be associated with the construction, operation, and closure phases for the major components of the mine site, transportation facilities, and pipeline under review in this EIS. The direct and indirect effects for each resource or resource use are analyzed on the basis of the factors of intensity (magnitude), duration, extent, and context of the impact (40 CFR 1508.27).

General scales for these four factors are provided below. Criteria were developed based on federal NEPA guidance and other recent NEPA analyses. This framework is used throughout the EIS and is adapted as necessary for each resource.

Intensity (Magnitude)

- No effect: The alternative would not affect the resource.
- Low: A change in a resource condition is perceptible, but it does not noticeably alter the resource's function in the ecosystem or cultural context.
- Medium: A change in a resource condition is measurable or observable, and an alteration to the resource's function in the ecosystem or cultural context is readily detectable.
- High: A change in a resource condition is measurable or observable, and an alteration to the resource's function in the ecosystem or cultural context is clearly and consistently observable.

Duration

- Temporary: Impacts would be intermittent, infrequent, or last only for the duration of the construction period (3 to 4 years).
- Long-term: Impacts would be frequent, or extend from the end of construction through the life of the mine (27.5 years), and up to 100 years.
- Permanent: Impacts would cause a permanent change in the resource that would last beyond the life of the Project even if the actions that caused the impacts were to cease.

Extent (Scope)

- Local: Impacts would be limited geographically to discrete portions of the EIS Analysis Area; impacts would not extend to a broad geographic region or a broad sector of the population and its range.
- Regional: Impacts would extend beyond a local area, potentially affecting resources or populations throughout the EIS Analysis Area.
- Extended: Impacts would potentially affect resources or populations beyond the region or EIS Analysis Area.

Context

As noted in this section's introduction, several resource sections have refined descriptions for the context criteria. The descriptions presented here are general in nature; resource-specific definitions are presented in the respective sections, as applicable.

- Common: The affected resource is not rare in the locality and is not protected by legislation, such as the *Endangered Species Act*, *Migratory Bird Treaty Act*, or *Wilderness Act*. The portion of the resource affected does not fill a unique social or ecological role within the locality or the region.
- Important: The affected resource fills a rare social or ecological role either within the locality or the region, or the rare resource is protected by specific legislation, such as the *Marine Mammal Protection Act*, the *National Historic Preservation Act*, or the *Migratory Bird Treaty Act*. The Congressionally-designated Iditarod National Historic Trail is considered an important

resource for the purposes of this analysis; the historic and scenic resources associated with the trail are considered rare within the region. However, designation as a state or federal conservation unit, such as National Wildlife Refuge or State Game Refuge, does not in and of itself constitute a rare resource.

Unique: The affected resource is protected by prescriptive legislation, such as the *Endangered Species Act* or the *Wilderness Act* and/or the portion of the resource affected fills a unique social or ecological role within the locality or the region.

3.0.4.2 SUMMARY IMPACT LEVELS

The rating scales provided below provide a guideline to place the effects of the alternatives in an appropriate context and to reach summary conclusions about the level of impact, taking into account the impact factors of intensity, duration, extent, and context. These tables are intended to serve as general guidelines to assist the reader in understanding the impact analysis. Detailed impact rating scales are provided for each resource at the beginning of the environmental consequences section. The impact criteria terms and thresholds are quantified where possible or assessed qualitatively when necessary. The terms used in the qualitative thresholds are relative, necessarily requiring the analyst to make a judgment about where a particular effect falls in the continuum from negligible to major. No effect is also possible.

No effect: The alternative would not affect the resource.

Negligible: Impacts are generally extremely low in intensity (often they cannot be measured or observed), are temporary, localized, and generally do not affect unique resources.

Minor: Impacts tend to be low intensity, of temporary duration, and local extent, although common resources may experience more intense, longer-term impacts.

Moderate: Impacts can be of any intensity or duration, although common and important resources may be affected by higher intensity, longer term, or broader extent impacts. Unique resources may be affected by medium or low intensity impacts, shorter duration or intermittent episodes of impact over a long period, at a local or regional scale.

Major: Impacts are generally medium or high intensity, long-term or permanent in duration, a regional or extended scope, and affect important or unique resources.

Impacts may be beneficial or adverse. Impacts are generally assumed to be adverse, unless specifically noted as beneficial.

3.0.5 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

Relevant past and present actions are those that have influenced the current condition of the resource. For the purposes of this EIS, past and present actions include both naturally-caused and human-controlled events. The past and present actions applicable to the cumulative effect

analysis are presented in Table 4.2-1 in Chapter 4, Cumulative Effects. That discussion describes the types of past, present, and future activities that may interact with the effects of the proposed Donlin Gold Project and alternatives. A detailed list of relevant Reasonably Foreseeable Future Actions is provided. Those activities considered but eliminated from further consideration are also listed in Table 4.2-2.